great Intercourfe with *England*, might introduce fome Greek Letters to exprefs thofe Sounds which they had not in their own Language ; from hence they were carried into *France*, with the reft of the *Saxon* Alphabet, and fo into *Italy*; which *Mabillon* alfo in effect acknowledges when he fays, *Hanc tamen Scripturæ formam non* Franci *à* Romanis, *qui* Langobardicis *paffim Elementis tunc utebantur, fed à* Francis Romani *accepiffe videntur*. But it would take up too much time here to difcourfe of the Original of the *Saxon* Character, and whence thofe Agreements between it and the pure *Merovingian* and *Lombard* Characters might at firft arife ; and perhaps the thing it felf does not deferve any farther enquiry.

An Eftimate of the Quantity of Vapour raifed out of the Sea by the warmth of the Sun ; derived from an Experiment fhown before the Royal Society, *at one of their late Meetings : by* E. Halley.

THat the quantity of aqueous Vapours contained in the *Medium* of the Air, is very confiderable, feems moft evident from the great Rains and Snows which are fometimes obferved to fall, to that degree, that the Water thus difcharged out of the Interftices of the Particles of Air, is in weight a very fenfible part of the incumbent Atmofphere : but in what proportion thefe Vapours rife, which are the Sources not only of Rains, but alfo of Springs or Fountains (as I defign to prove) has not, that I know of, been any where well examined, tho it feem to be one of the moft neceffary Ingredients of a real and Philofophical Meteorology ; and as fuch, to deferve the confideration of this Honourable Society. I thought it might not be unacceptable, to attempt, by Experiment to determine the quantity of the Evaporations of Water, as far as they arife from Heat ; which, upon Tryal, fucceeded as follows.   We

We took a Pan of Water, about 4 inches deep, and 7 inches $\frac{9}{10}$ diameter, in which we placed a Thermometer, and by means of a Pan of Coals, we brought the Water to the same degree of heat which is obferved to be that of the Air in our hotteft Summers; the Thermometer nicely fhewing it. This done, we affixed the Pan of Water, with the Thermometer in it, to one end of the Beam of the Scales, and exactly counterpoifed it with weights in the other Scale; and by the application or removal of the Pan of Coals, we found it very eafie to maintain the Water in the fame degree of Heat precifely. Doing thus, we found the weight of the Water fenfibly to decreafe; and at the end of two hours we obferved that there wanted half an ounce *Troy*, all but 7 grains, or 233 grains of Water, which in that time had gone off in Vapour; tho one could hardly perceive it fmoak, and the Water were not fenfibly warm. This Quantity in fo fhort a time feemed very confiderable, being little lefs than 6 ounces in 24 hours from fo fmall a Surface as a Circle of 8 Inches diameter. To reduce this Experiment to an exact Calculus and determine the thicknefs of the skin of Water that had fo evaporated, I affume the Experiment alledged by Dr. *Edward Bernard* to have been made in the *Oxford* Society, *viz.* That the Cube foot, *Englifh*, of Water weighs exactly 76 pounds *Troy*; this divided by 1728, the number of inches in a foot will give $253\frac{1}{3}$ grains, or $\frac{1}{2}$ ounce $13\frac{1}{3}$ grains for the weight of a Cube inch of Water; wherefore the weight of 233 grains is $\frac{233}{253}$ or 35 parts of 38 of a Cube inch of Water. Now the Area of the Circle, whofe Diameter is 7 $\frac{9}{10}$ inches, is 49 fquare inches; by which dividing the quantity of Water evaporated, *viz.* $\frac{35}{38}$ of an inch, the Quote $\frac{35}{1862}$ or $\frac{1}{53}$ fhews that the thicknefs of the Water evaporated, was the 53 *d* part of an Inch: but we will fuppofe it only the fixtieth part, for the facility of Calculation. If therefore Water as warm as the Air in Summer, exhales the thicknefs of a 60 part of an inch in two hours from its whole Surface, in twelve hours it will exhale the $\frac{1}{10}$ of an inch; which quantity, will be found abundantly fufficient to ferve for all the Rains,

Springs

Springs and Dews, and account for the *Caspian* Seas being always at a stand, neither wasting nor overflowing; as likewise for the Current said to set always in, at the Streights of *Gibralter*, tho those Mediterranean Seas receive so many and so considerable Rivers.

To estimate the quantity of Water arising in Vapour out of the Sea, I think I ought to consider it only for the time the Sun is up, for that the Dews return in the Night, as much if not more, Vapours than are then emitted; and in Summer the Days being longer than twelve hours, this excess is ballanced by the weaker Action of the Sun, especially when rising, before the Water be warmed: so that if I allow $\frac{1}{10}$ of an inch of the Surface of the Sea to be raised *per diem* in Vapours, it may not be an improbable Conjecture.

Upon this Supposition, every 10 square Inches of the Surface of the Water yields in Vapour *per diem* a Cube inch of Water; and each square foot half a Wine-pint; every space of 4 foot square, a Gallon; a mile square, 6914 Tons; a square Degree, supposed of 69 *English* miles, will evaporate 33 Millions of Tons: and if the Mediterranean be estimated at 40 Degrees long and 4 broad, Allowances being made for the Places where it is broader by those where it is narrower, (and I am sure I ghess at the least,) there will be 160 square Degrees of Sea; and consequently, the whole Mediterranean must lose in Vapour, in a Summers-day, at least 5280 Millions of Tons. And this quantity of Vapour, tho very great, is as little as can be concluded from the Experiment produced: And yet there remains another Cause, which cannot be reduced to Rule, I mean the Winds, whereby the Surface of the Water is lick'd up sometimes faster than it exhales by the heat of the Sun; as is well known to those that have considered those drying Winds which blow sometimes.

To estimate the quantity of Water the Mediterranean Sea receives from the Rivers that fall into it, is a very hard task, unless one had the opportunity to measure their Channels and Velocity; and therefore we can only do it by allowing more

than

than enough; that is, by affuming thefe Rivers greater than in all probability they be, and then comparing the quantity of Water voided by the *Thames*, with that of thofe Rivers whofe Water we defire to compute.

The Mediterranean receives thefe confiderable Rivers; the *Iberus*, the *Rhone*, the *Tiber*, the *Po*, the *Danube*, the *Neifter*, the *Boryfhenes*, the *Tanais*, and the *Nile*, all the reft being of no great note, and their quantity of Water inconfiderable. Thefe nine Rivers, we will fuppofe each of them to bring down ten times as much Water as the River *Thames*; not that any of them is fo great in reality, but to comprehend with them all the fmall Rivulets that fall into the Sea, which otherwife I know not how to allow for.

To calculate the Water of the *Thames*, I affume that at *Kingfton* Bridge, where the Flood never reaches, and the Water always runs down, the breadth of the Channel is 100 Yards, and its depth 3, it being reduced to an equality; (in both which Suppofitions I am fure I take with the moft.) Hence the Profil of the Water in this Place is 300 fquare Yards: this multiplied by 48 miles, (which I allow the Water to run in 24 hours, at 2 miles an hour) or 84480 Yards, gives 25344000 Cubick Yards of Water to be evacuated every day; that is, 20300000 Tons *per diem*; and I doubt not but in the excefs of my meafures of the Channel of the River, I have made more than fufficient allowance for the Waters of the *Brent*, the *Wandel*, the *Lea*, and *Darwent*, which are all worth notice, that fall into the *Thames* below *Kingfton*.

Now if each of the aforefaid 9 Rivers yield 10 times as much Water as the *Thames* doth, 'twill follow that each of them yields but 203 millions of Tons *per diem*, and the whole 9 but 1827 millions of Tons in a day; which is but little more than ⅓ of what is proved to be raifed in Vapour out of the Mediterranean in 12 hours time. Now what becomes of this Vapour when raifed, and how it comes to pafs that the Current always fets in at the mouth of the Streights of *Gibralter*, is intended, with leave, for a farther Entertainment

tainment of this Honourable Company: in the mean time, it it needful to advertife the Reader, that in making the Experiment herein mentioned, the Water ufed, had been falted to the fame degree as is the common Sea·water, by the Solution of about a 40*th* part of Salt.

Obfervationes nonnullæ Eclipfeos Nuperæ Solaris, Maii 1. St. vet. diverfis in locis habitæ, ac cum Regiâ Societate Communicatæ.

H ÆC *Eclipfis, etiamfi contemnendæ quantitatis fuerit, ac nudis oculis non omnino percipi potuerit, tamen ad accuratam determinationem Parallaxis & Latitudinis Lunæ maxime idonea videtur. Quapropter quas hactenus obtinere potuimus obfervationes cape Lector Benevole.*

Londini *feorfim obfervantibus* Hookio & Halleio; *Initii momentum, cœlo licet puriffimo, ob obliquam incidentiam Lunæ, debite definire non licuit. Sed hora* 1^h. 16'. *jam cæpta erat Eclipfis fatis notabiliter: circa* 1^h.40'. *prope medium Eclipfis, Chorda partis Eclipfatæ, five inter cornua, inventa eft* 9'. 30". *cui refpondet arcus* 36 gr. *in diametro vero non nifi* 1'. 30". *Finis confenfu utriufque obfervatoris contigit accurate hora* 2^h. 3'. 00.

Grenovici *in Obfervatorio Regio* Flamfteedius *eadem de caufa Initium non vidit, finem vero determinavit* 2^h. 4'. 15". *Medio Eclipfis five maximâ obfcuratione, Chorda partis Eclipfatæ erat* 9'. 54".

Apud Totteridge *prope* Londinum *verfus Corum, finem videt* Dominus Haines, Reg. Soc. Soc. *ad* 2^h. 2'. *Quantitatem vero Maximam dimidii Digiti, ab Auftro.*

In Infula Barbada, *ad Oppidum* Bridge-Town, *fub Lat.* 12 gr. 58'. *Finem habuit Dominus* Frank 1'. 30". *temporis ante quam Solis Altitudo fuit* 31 gr. 47'. *ad ortum, hoc eft hora* 7^h. 56'. 45". A. M. *Quantitatem Maximam æftimatione definivit duorum digitorum ab Auftro.*

Norim.